

REMARKS

I. Status of Claims

Claims 1-14 are pending in the application, and all the claims are rejected.

Claim 1 is amended to incorporate the subject matter of claim 2. Accordingly, claim 2 is canceled without prejudice or disclaimer. Claim 3 is amended to correct dependency from claim 1.

No new matter is added. Accordingly, entry of the Amendment is respectfully requested.

II. Response to Claim Rejections Under 35 U.S.C. § 102

A. Claims 1, 4, 6, 9, 10, 13 and 14 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Goldsmith et al. (U.S. Patent No. 5,221,484).

B. Claims 1, 13 and 14 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Yoshikawa et al. (U.S. Patent No. 6,503,294).

C. Claims 1, 5, 6, 9 and 11-14 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Verduijn et al. (U.S. Patent No. 6,090,289).

D. Claims 1, 6, 9, 10, 13 and 14 are rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Lai et al. (U.S. Patent No. 5,871,650).

Applicants respectfully traverse the § 102 rejections, at least for the following reasons.

Claim 1 is amended to incorporate the subject matter of claim 2. Claim 2 is not subject to a rejection under 35 U.S.C. § 102(b). Therefore, amended claim 1 is patentable over any of Goldsmith, Yoshikawa, Verduijn or Lai. Claims 4-6 and 9-14 are patentable, at least by virtue of their dependence from claim 1.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 102 rejections of claims 1, 4-6 and 9-14.

III. Response to Claim Rejections Under 35 U.S.C. § 103

A. Claims 2-6 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Lai and Verduijn and Goldsmith.

B. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Lai and Moyer et al. (U.S. Patent No. 5,198,007).

Applicants respectfully traverse, at least for the following reasons.

The separation membrane of the present invention is used for separating water from organic solvent. See page 1 lines 19-23 of the present specification. The separation capabilities of the separation membrane were evaluated by the PV testing apparatus as shown in Fig. 5 of the specification. Therefore, the separation capabilities were at a good performance level. See page 22 line 8 to page 34 line 10 of the specification.

For the separation membrane which fulfills the above condition, since the porous substrate shows a nitrogen gas permeation rate of not less than $200 \text{ m}^3/(\text{m}^2\cdot\text{hr}\cdot\text{atm})$, it is possible to ensure a sufficient gas permeability. Therefore, when the membrane is used for separating water from alcohol in a large amount, it is possible to increase the water permeation rate sufficiently so as to ensure an adequate separation capability. Incidentally, when the nitrogen gas permeation rate through the porous substrate is set to be more than $7000 \text{ m}^3/(\text{m}^2\cdot\text{hr}\cdot\text{atm})$, it becomes necessary to change parameters which determine the characteristics of the porous substrate, for instance, to increase the porosity of porous substrate, or to make the mean pore diameter larger. If the porosity is increased, it will hardly be possible to secure the mechanical strength of the porous substrate. If the mean pore diameter is enlarged, a fear of the occurrence of pinholes will arise on the zeolite membrane preparation as mentioned later, which is followed by a failure of giving the intended separation performance as the separation membrane. Thus,

the nitrogen gas permeation rate is regulated to be in the range of 200 - 7000 m³/(m²·hr·atm).

When the nitrogen gas permeation rate is set to not less than 400 m³/(m²·hr·atm), it will be expected that the more desirable separation capability. See page 5 line 17 to page 6 line 12 of the specification.

Lai, Verduijn and Moyer do not teach a membrane for separating water from organic solvent. Therefore, the feature “a nitrogen gas permeation rate through the porous Substrate is in the range of 200 - 7000 m³/(m²·hr·atm)” of the amended claim 1, which incorporates the subject matter of claim 2, would not be obvious to a person of ordinary skill in the art at the time of the present invention. Moreover, claims 3-6 are patentable over Lai, Verduijn and Goldsmith, at least by virtue of their dependence from claim 1.

Additionally, claims 7 and 8 are patentable over Lai in view of Moyer because claims 7 and 8 depend from claim 1, and claim 1 is patentable over Lai, as discussed above with respect to the § 102 rejection of claim 1 based on Lai. Moyer does not cure the above deficiency in Lai.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the § 103 rejections of claims 2-8.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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